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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/690,850	10/22/2003	William G. Marancik	307/1/014 N	5407

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EXAMINER	
KOPEC, MARK T	

ART UNIT	PAPER NUMBER
1751	

DATE MAILED: 07/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/690,850	MARANCIK ET AL.	
	Examiner	Art Unit	
	Mark Kopec	1751	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *2,8 and 9* is/are allowed.

6)☒ Claim(s) *1,3-7 and 10-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various

claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 3 and 12-14 are rejected under 35 U.S.C. 102(b) as anticipated by Ziegler et al (3,954,572), Tachikawa et al (4,435,228), or Tachikawa et al (4,431,572).

Ziegler et al (3,954,572) discloses a method for the manufacture of a superconductor having a superconductive intermetallic compound consisting of at least two elements in which at least one core containing at least one ductile element of the compound is surrounded by a jacket of ductile matrix material, after which the structure so obtained is subjected to a cross section-reducing process and the remaining elements of the compound subsequently applied to the jacket of matrix material followed by a heat treatment performed in a manner such that the compound is formed through a reaction of the remaining elements with the core after diffusion through the matrix material. The

remaining elements are applied as a sheath of an alloy containing these elements along with a carrier metal which is deposited on the jacket of the matrix material after the last cross section-reducing process step and before heat treatment for forming the compound (Abstract). The method of the present invention finds particular advantage in manufacturing the superconductor having the intermetallic compound Nb.sub.3 Sn. As disclosed, at least one niobium core is surrounded by a copper jacket after which cross section reducing is carried out. Thereupon a sheath of a copper tin alloy is electroplated onto the copper jacket. Copper tin alloys are particularly well suited for electroplating. In accordance with the preferred embodiment, a sheath of a copper tin alloy with 3 to 15 atom-percent and preferably about 12 atom-percent of tin and the rest copper, is deposited on the jacket. Copper tin alloys having less than 3 atom-percent of tin contain insufficient tin to form satisfactory Nb.sub.3 Sn layers. Copper tin alloys having more than 15 atom-percent of tin can be used in principle so long as their melting point is still sufficiently high. However, alloys having a tin content this high, i.e., above 15 atom-percent, present a danger that undesirable brittle copper-tin phases will be formed during the heat treatment. As disclosed, the copper tin alloys with 3 to 15 atom-percent of tin are caused to diffuse into the copper matrix during a first stage

of heat treatment performed at a temperature of about 600.degree.C for approximately 6 hours. The second step of the heat treatment is then carried out at a temperature of between 650.degree. and 850.degree.C and can last up to more than 100 hours (Col 4, lines 44-68). FIG. 1 illustrates a cross sectional view of an arrangement according to the present invention for manufacturing a superconductor with the intermetallic compound Nb.sub.3 Sn for example. In accordance with the present invention, a core 1 of niobium in wire form is surrounded by a tubular copper jacket 2. This can be carried out, for example, by inserting the niobium core 1 in wire form into a copper tube 2. The body obtained in this manner is then processed using suitable drawing or rolling passes without intermediate annealing into a long wire of reduced cross section. After the last cold-forming pass, the sheath 3 which is of a copper-tin alloy having tin in the range of 3 to 15 atom-percent tin and the rest copper and preferably with 12 atom-percent tin, is deposited on the jacket by electroplating (Col 6, lines 25-40).

Tachikawa et al (4,435,228) discloses a process for producing a Nb.sub.3 Sn superconducting wire, which comprises preparing a composite from a copper alloy material containing 0.1 to 5 atomic percent in total of at least one element of Group IV

of the periodic table selected from titanium, zirconium and hafnium, a tin material and a niobium material, processing the composite into a wire, tape or tube, and heat-treating the processed composite at a temperature of 400.degree. to 900.degree. C. to form a Nb.sub.3 Sn compound (Abstract). The invention provides a process for producing a Nb.sub.3 Sn superconducting wire, which comprises preparing a composite from a copper alloy matrix containing 0.1 to 5 atomic percent, preferably 0.2 to 3 atomic percent, especially preferably 0.5 to 2 atomic percent, in total of at least one element of Group IV of the periodic table selected from titanium, zirconium and hafnium, and niobium cores, thereafter processing the composite into a wire, tape or tube, coating the surface of the processed composite with tin by electroplating, etc., and heat-treating the coated composite at a temperature of 400.degree. to 900.degree. C. to form a Nb.sub.3 Sn compound around the niobium cores (Col 3, lines 14-25). The tin material used in this invention is most preferably pure tin, but is not limited to it. For example, a tin-copper alloy containing up to 30 atomic percent of copper does not deteriorate the performance of the resulting superconducting wire (Col 3, lines 62-66).

Tachikawa et al (4,431,572) discloses a method for producing a Nb.sub.3 Sn superconductor which comprises drawing a composite having a core of a Nb-Hf alloy containing 0.1 to 30 atomic % of Hf and a sheath containing Cu and Sn, and heat-treating the composite to form a Nb.sub.3 Sn layer between the core and the sheath; the improvement wherein the sheath is formed of pure Cu, a Cu-Sn alloy containing not more than 6 atomic % of Sn, a Cu-Ga alloy containing not more than 20 atomic % of Ga, a Cu-Al alloy containing not more than 20 atomic % of Al, a Cu-Ga-Sn alloy containing not more than 6 atomic % of Sn and not more than 20 atomic % of Ga, or a Cu-Al-Sn alloy containing not more than 6 atomic % of Sn and not more than 20 atomic % of Al; and after the drawing, a Sn film is coated on the surface of the sheath, and then the product having a Sn film coated thereon is heat-treated (Abstract). A composite is produced from the aforesaid metals or alloys, and fabricated into a wire, tape tube, etc. by wire drawing, rolling, tube drawing, etc. Then, pure Sn or Sn alloy is coated on the outside surface of the sheath portion of the fabricated product. The method for coating of Sn may be any desired method such as electroplating, hot-dip plating or vacuum deposition. In the case of hot-dip plating, Cu may be added to a molten plating bath. Cu included in the plated film serves to promote the diffusive formation of Nb.sub.3 Sn during the heat-

treatment. In order to obtain a sufficient effect, the amount of Cu is preferably at least 0.1 atomic %. To obtain a plated film of good quality, the amount of Cu is preferably not more than 50 atomic % (Col 3, lines 17-30; example 1).

The references either specifically or inherently meet each of the claimed limitations.

The references are anticipatory.

Claims 4-7 and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ziegler et al (3,954,572), Tachikawa et al (4,435,228), or Tachikawa et al (4,431,572).

The references are relied upon as set forth above.

The references differ from the instant claims in failing to specifically recite the claimed initial/final ration of Cu/filament or cross-sectional area.

It is the examiner's position that the skilled artisan would have to utilize only routine testing in order to arrive such values. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). For more recent cases applying this principle, see Merck & Co. Inc. v. Biocraft Laboratories Inc., 874 F.2d 804, 10 USPQ2d 1843

(Fed. Cir.), cert. denied, 493 U.S. 975 (1989); In re Kulling, 897 F.2d 1147, 14 USPQ2d 1056 (Fed. Cir. 1990); and In re Geisler, 116 F.3d 1465, 43 USPQ2d 1362 (Fed. Cir. 1997).

In view of the foregoing, the above claims have failed to patentably distinguish over the applied art.

Claims 2, 8 and 9 are allowed.

The remaining references listed on forms 892 and 1449 have been reviewed by the examiner and are considered to be cumulative to or less material than the prior art references relied upon in the rejection above.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Kopec whose telephone number is (571) 272-1319. The examiner can normally be reached on Monday - Friday from 9:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Yogendra Gupta can be reached on (571) 272-1316. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mark Kopec
Primary Examiner
Art Unit 1751

MK
July 15, 2004